What is claimed is:

1. A high thermal conductive material comprising: substantially silicon carbide and metal silicon.

2. The high thermal conductive material according to claim 1, wherein voids formed by bonding crystals of the silicon carbide are impregnated with the metal silicon.

3. The high thermal conductive material according to claim 2, wherein the metal silicon is contained in an amount of 4-30 wt% and the high thermal conductive material has a bulk specific gravity of 2.95-3.05 and a coefficient of thermal conductivity of 190 W/mK or more.

4. The high thermal conductive material according to claim 3, wherein the silicon carbide consists essentially of α-SiC.

5. The high thermal conductive material according to claim 2, wherein the metal silicon is contained in an amount of 4-20 wt% and the high thermal conductive material has a bulk specific gravity of 3.05-3.18 and a coefficient of thermal conductivity of 230 W/mK or more.

6. The high thermal conductive material according to claim 2, wherein the metal silicon is contained in an

amount of 4-15 wt% and the high thermal conductive material has a bulk specific gravity of 3.08-3.18 and a coefficient of thermal conductivity of 250 W/mK or more.

7. The high thermal conductive material according to claim 5, wherein the silicon carbide consists essentially of α-SiC and β-SiC.

8. The high thermal conductive material according to claim 6, wherein the silicon carbide consists essentially of α-SiC and β-SiC.

9. The high thermal conductive material according to claim 3, wherein the high thermal conductive material has a coefficient of thermal expansion of 3×10^{-6}/K or less.

10. The high thermal conductive material according to claim 5, wherein the high thermal conductive material has a coefficient of thermal expansion of 3×10^{-6}/K or less.

11. The high thermal conductive material according to claim 6, wherein the high thermal conductive material has a coefficient of thermal expansion of 3×10^{-6}/K or less.

12. A process for producing the high thermal conductive material according to claim 3, which comprises:

adding an organic binder and a dispersant or a binder

having a dispersing effect to a silicon carbide powder to obtain a mixture,

forming the mixture by cast forming or pressure forming to obtain a formed product,

treating the formed product with heat at 2,100-2,500°C for 1-5 hours to obtain a base material, and

impregnating the base material with metal silicon at 1,450-1,800°C under reduced pressure.

13. A process for producing the high thermal conductive material according to claim 5, which comprises:

adding an organic binder and a dispersant or a binder having a dispersing effect to a silicon carbide powder to obtain a mixture,

forming the mixture by cast forming or pressure forming to obtain a formed product,

treating the formed product with heat at 2,100-2,500°C for 1-5 hours to obtain a base material,

impregnating the base material with an organic resin,

drying the base material,

treating the base material with heat, and

impregnating the base material with metal silicon at 1,450-1,800°C under reduced pressure.

14. A process for producing the high thermal conductive material according to claim 6, which comprises:

adding an organic binder and a dispersant or a binder

having a dispersing effect to a silicon carbide powder to obtain a mixture,

forming the mixture by cast forming or pressure forming to obtain a formed product,

treating the formed product with heat at 2,100-2,500°C for 1-5 hours to obtain a base material,

impregnating the base material with an organic resin,

drying the base material,

treating the base material with heat,

impregnating the base material with metal silicon at 1,450-1,800°C under reduced pressure,

treating the base material with heat at 2,100-2,500°C for 1-5 hours, and

impregnating the base material with the metal silicon at 1,450-1,800°C under reduced pressure.

15. The process for producing a high thermal conductive material according to claim 13, wherein the residual carbon content in the organic resin is 30 wt% or more.

16. The process for producing a high thermal conductive material according to claim 14, wherein the residual carbon content in the organic resin is 30 wt% or more.

17. The process for producing a high thermal

conductive material according to claim 13, wherein the base material is treated with heat at 200-1,000°C in a non-oxidizing atmosphere after being impregnated with the organic resin and dried.

18. The process for producing a high thermal conductive material according to claim 14, wherein the base material is treated with heat at 200-1,000°C in a non-oxidizing atmosphere after being impregnated with the organic resin and dried.

19. The process for producing a high thermal conductive material according to claim 13, wherein impregnation with the organic resin, drying, and heat treatment are respectively carried out at least once.

20. The process for producing a high thermal conductive material according to claim 14, wherein impregnation with the organic resin, drying, and heat treatment are respectively carried out at least once.

21. The process for producing a high thermal conductive material according to claim 13, wherein the organic resin is a phenolic resin.

22. The process for producing a high thermal conductive material according to claim 14, wherein the

organic resin is a phenolic resin.

23. The process for producing a high thermal conductive material according to claim 12, wherein the silicon carbide powder comprises 30-60 wt% of coarse particles with an average particle size of 50-150 μm, 1-5 wt% of medium particles with an average particle size of 5-50 μm, 1-5 wt% of medium particles with an average particle size of 1-10 μm, and 30-60 wt% of fine particles with an average particle size of 0.1-5 μm.

24. The process for producing a high thermal conductive material according to claim 13, wherein the silicon carbide powder comprises 30-60 wt% of coarse particles with an average particle size of 50-150 μm, 1-5 wt% of medium particles with an average particle size of 5-50 μm, 1-5 wt% of medium particles with an average particle size of 1-10 μm, and 30-60 wt% of fine particles with an average particle size of 0.1-5 μm.

25. The process for producing a high thermal conductive material according to claim 14, wherein the silicon carbide powder comprises 30-60 wt% of coarse particles with an average particle size of 50-150 μm, 1-5 wt% of medium particles with an average particle size of 5-50 μm, 1-5 wt% of medium particles with an average particle size of 1-10 μm, and 30-60 wt% of fine particles with an

average particle size of 0.1-5 μm.